

# Risk Management of On - Line Maintenance

Craig Nierode  
Monticello Nuclear Generating Plant

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Obninsk, Russia

- Background of MNGP
- Current PSA Model and Tools
- Future PSA Model and Tools
- Maintenance Rule (a)(4)
- Users of PSA Tools
- Maintenance Rule Expert Panel
- Maintenance Rule Quarterly Report
- Examples (hypothetical and actual)

- GE BWR-3
- 1775 MW<sub>t</sub> 613 MW<sub>e</sub>
- Commercial Operation: June 30, 1971
- Plant Located 45 miles NW of Minneapolis, Minnesota, USA

# Current PSA Model

- EPRI Risk and Reliability  
Workstation - CAFTA
- SETS
- EPRI Risk and Reliability  
Workstation - EOOS
- EOOS uses 40,000 predetermined  
Cut Sets

# Future PSA Model

- EPRI Risk and Reliability  
Workstation - CAFTA, PRAQUANT,  
etc.
- EPRI Risk and Reliability  
Workstation - EOOS
- PSA quantified within EOOS for  
each case (generate new cut sets  
for each study)
- Add Large Early Release  
Frequency (LERF)

# Maintenance Rule Revision

## 10CFR50:65 (a)(4)

Before performing maintenance activities ..., the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities.

Implementation date is November 28, 2000.

## Users of On - Line Maintenance Risk Management Tools at MNGP

- **EOOS** - Scheduling Group and PRA Group
- **Operations** - contacts Scheduling Group or PRA Group for equipment out of service not covered in schedule
- **Plant Staff** - Risk Assessment of planned maintenance for the day is announced daily to plant staff
- **Maintenance Rule** - Coordinator and Expert Panel
- **NRC Resident Inspector** - Daily risk announcement relayed to NRC Region III

## Maintenance Rule Expert Panel

- Set Performance Criteria for plant equipment using PRA insights
- Reviews historical plots of instantaneous risk vs. time
- Reviews historical plots of integrated risk vs. time



## Maintenance Rule Quarterly Report

- Report of performance criteria status for each system
- Historical plots of instantaneous risk vs. time
- Historical plots of integrated risk vs. time
- Sent to NMC and plant management
- Provided to NRC Resident Inspector
- Posted on Monticello Intranet (Internal Web site)

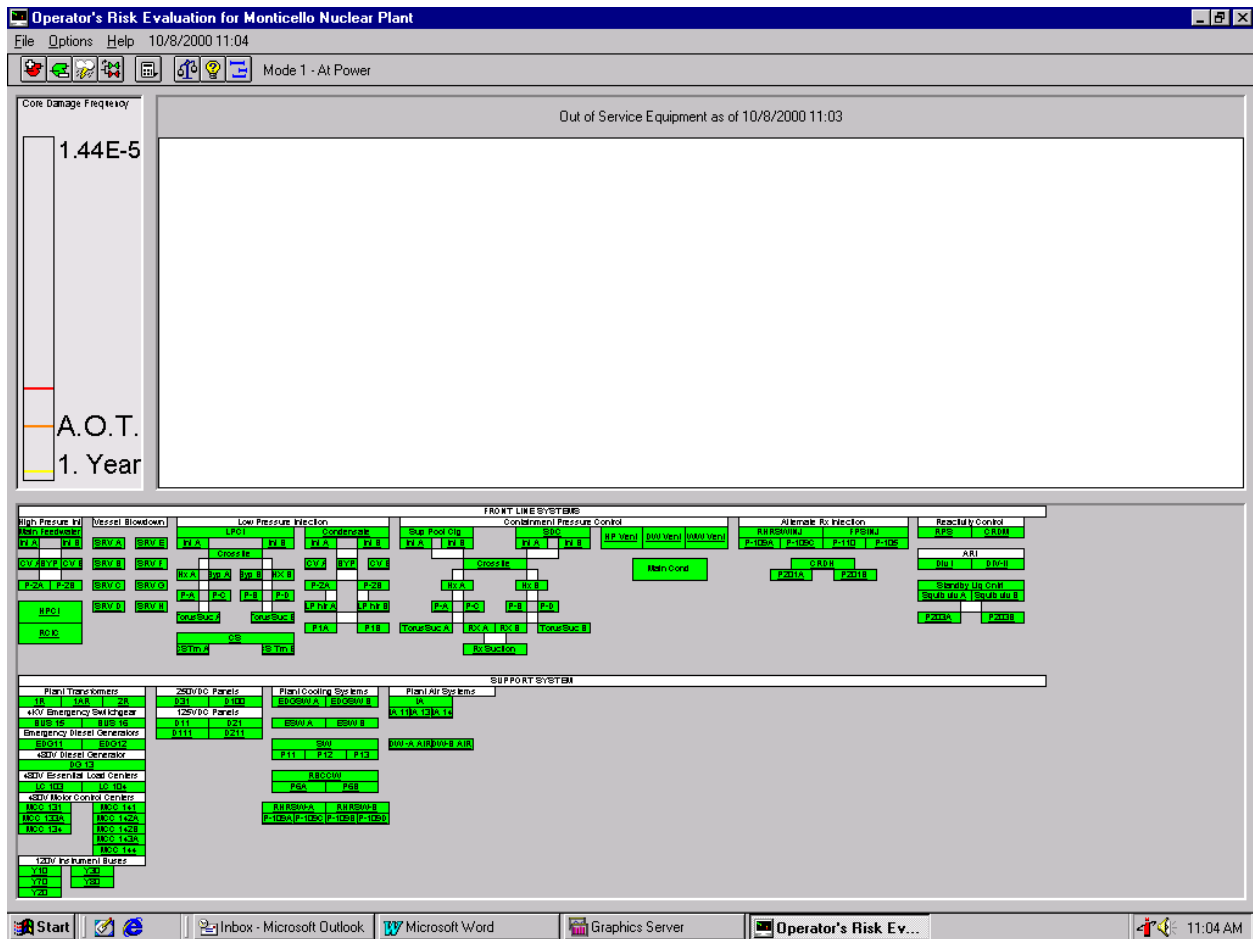


Figure 1  
Risk Management of On-Line Maintenance at MNGP  
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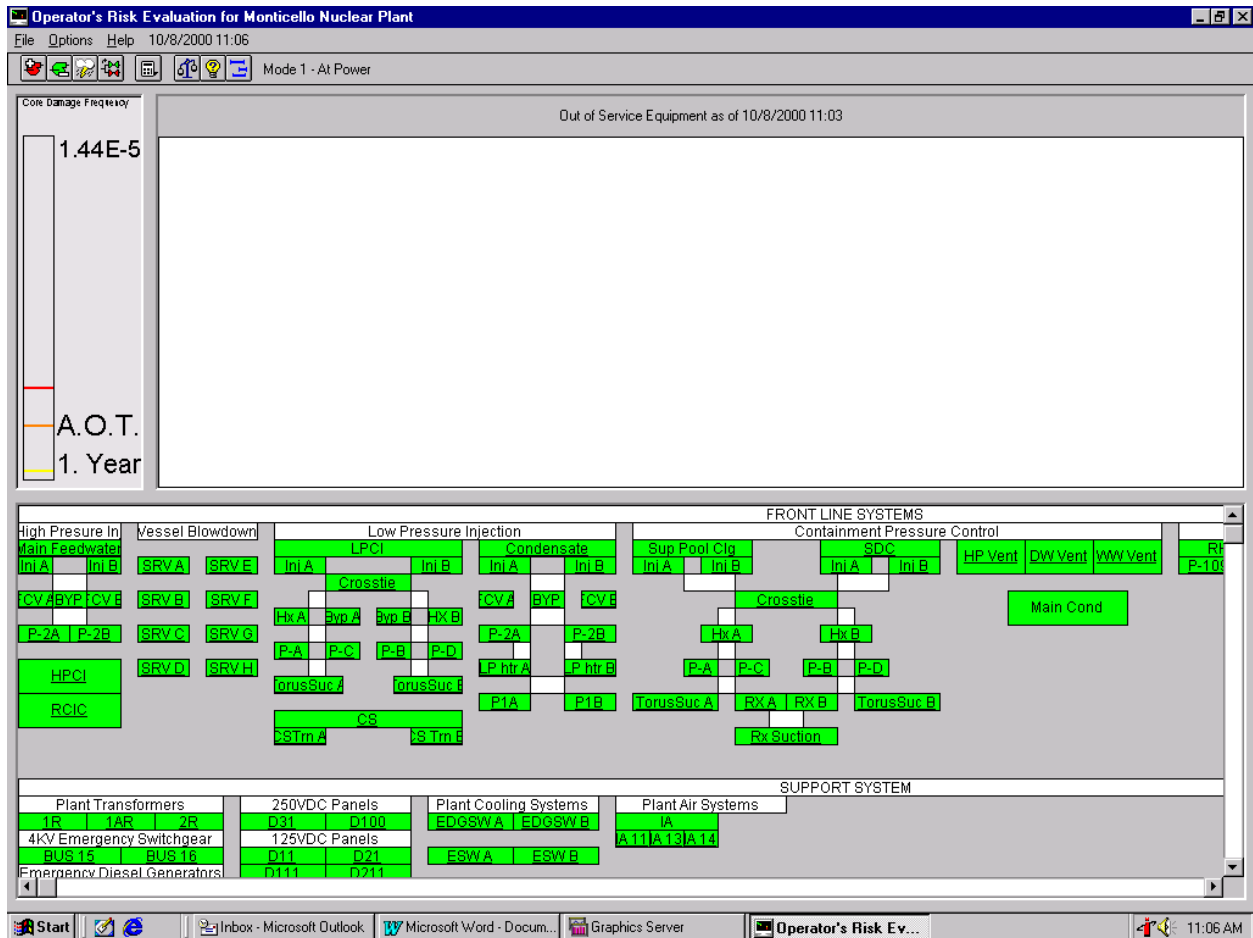


Figure 2  
Risk Management of On-Line Maintenance at MNGP  
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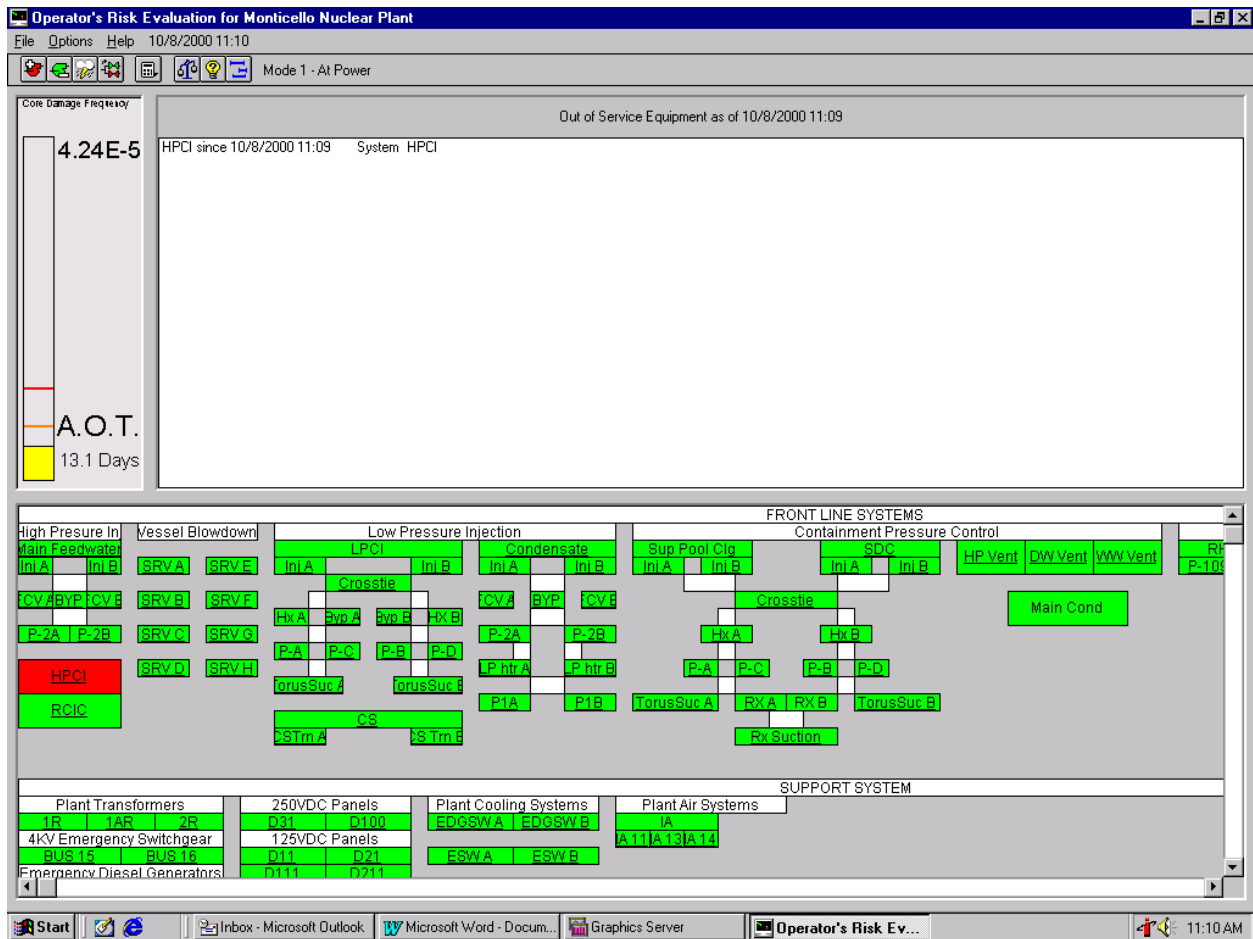


Figure 3  
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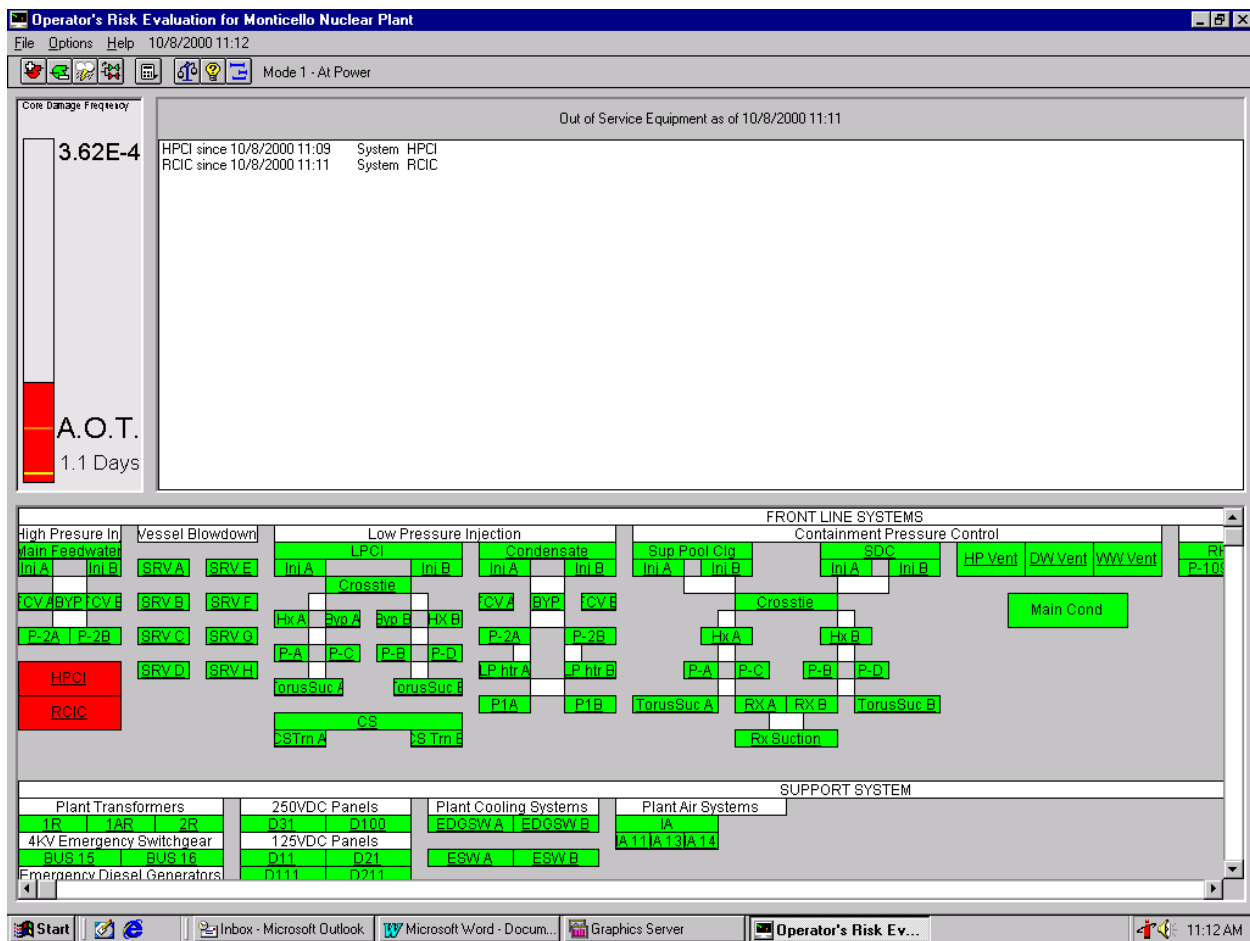


Figure 4  
Risk Management of On-Line Maintenance at MNGP  
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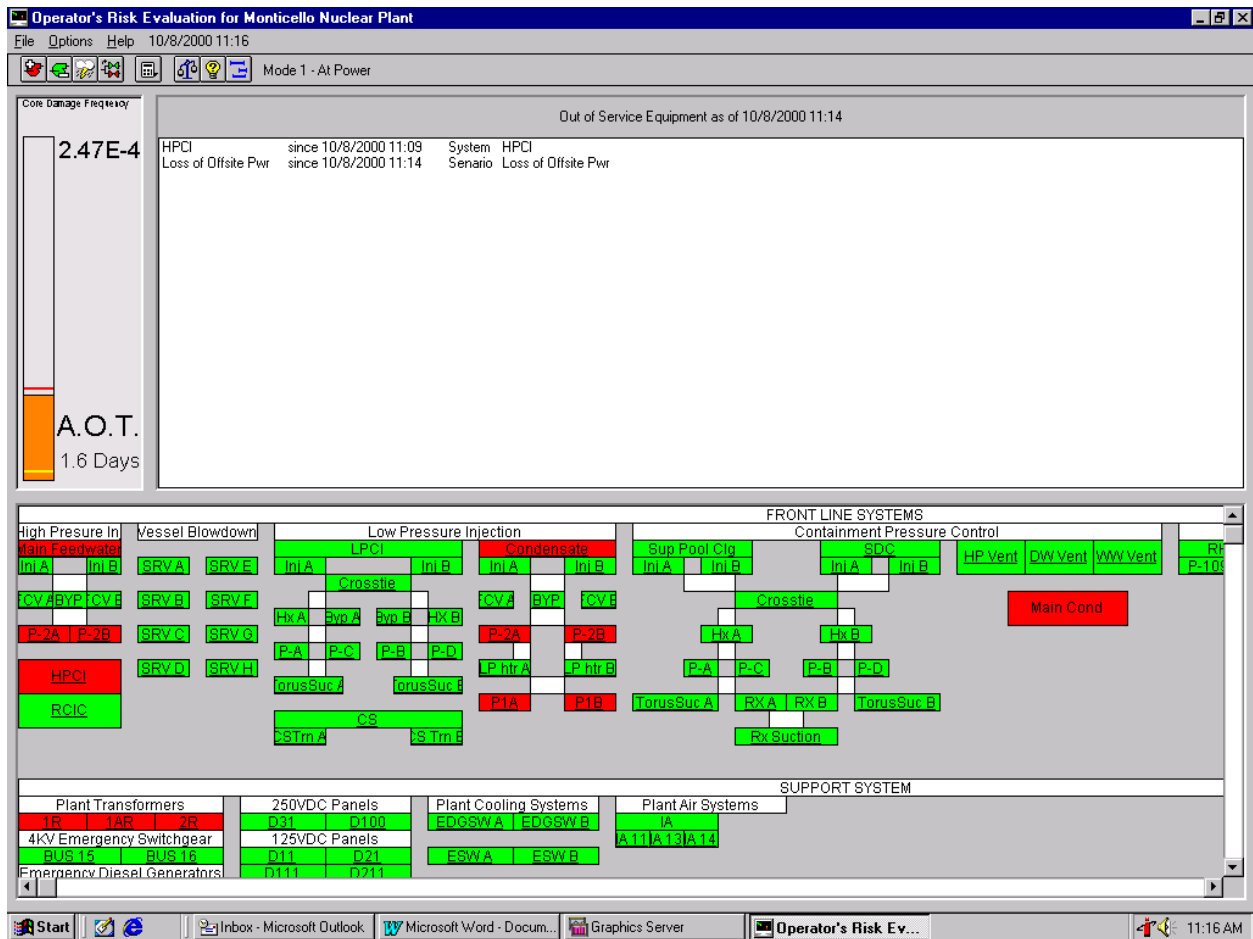


Figure 5  
Risk Management of On-Line Maintenance at MNGP  
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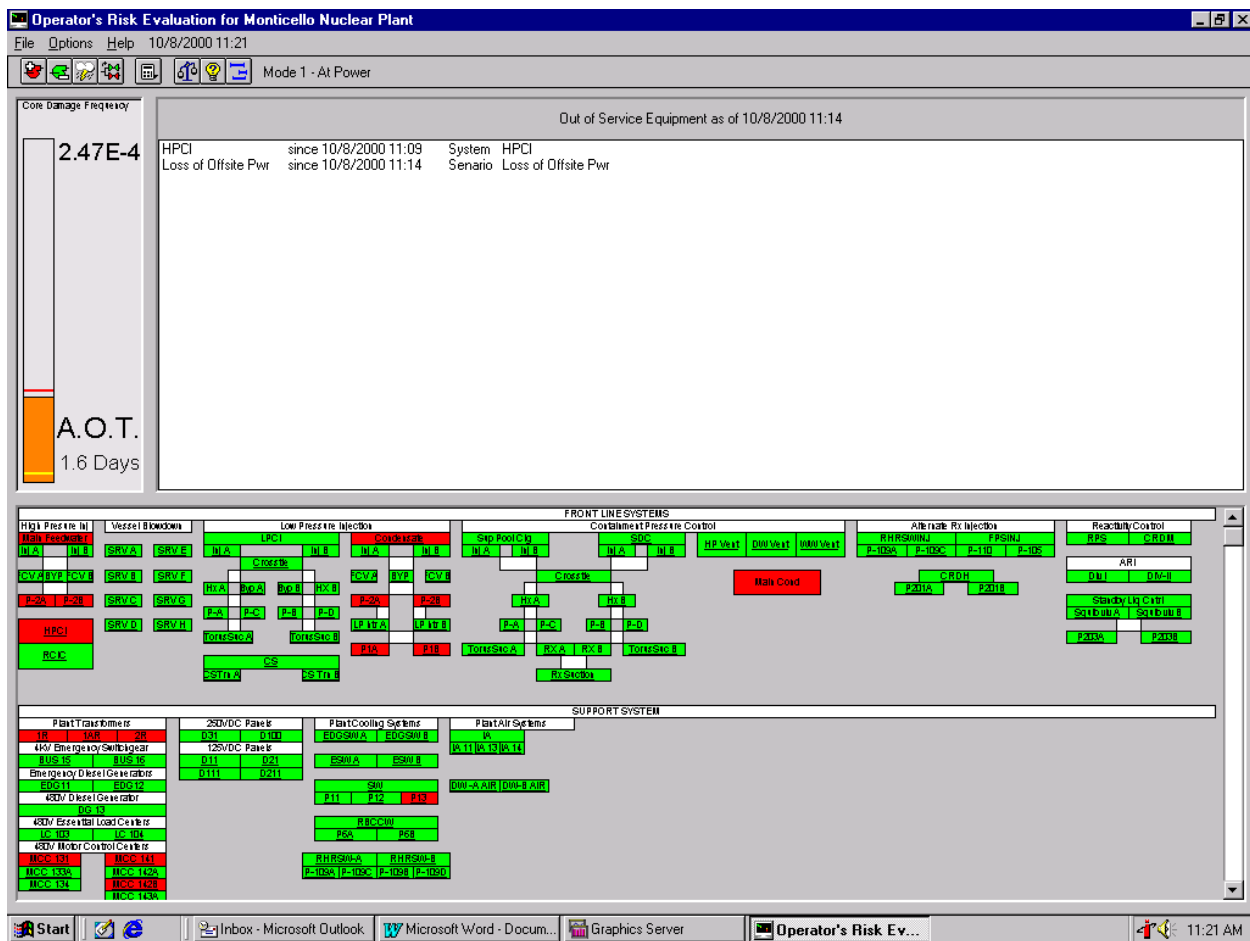


Figure 6  
Risk Management of On-Line Maintenance at MNGP  
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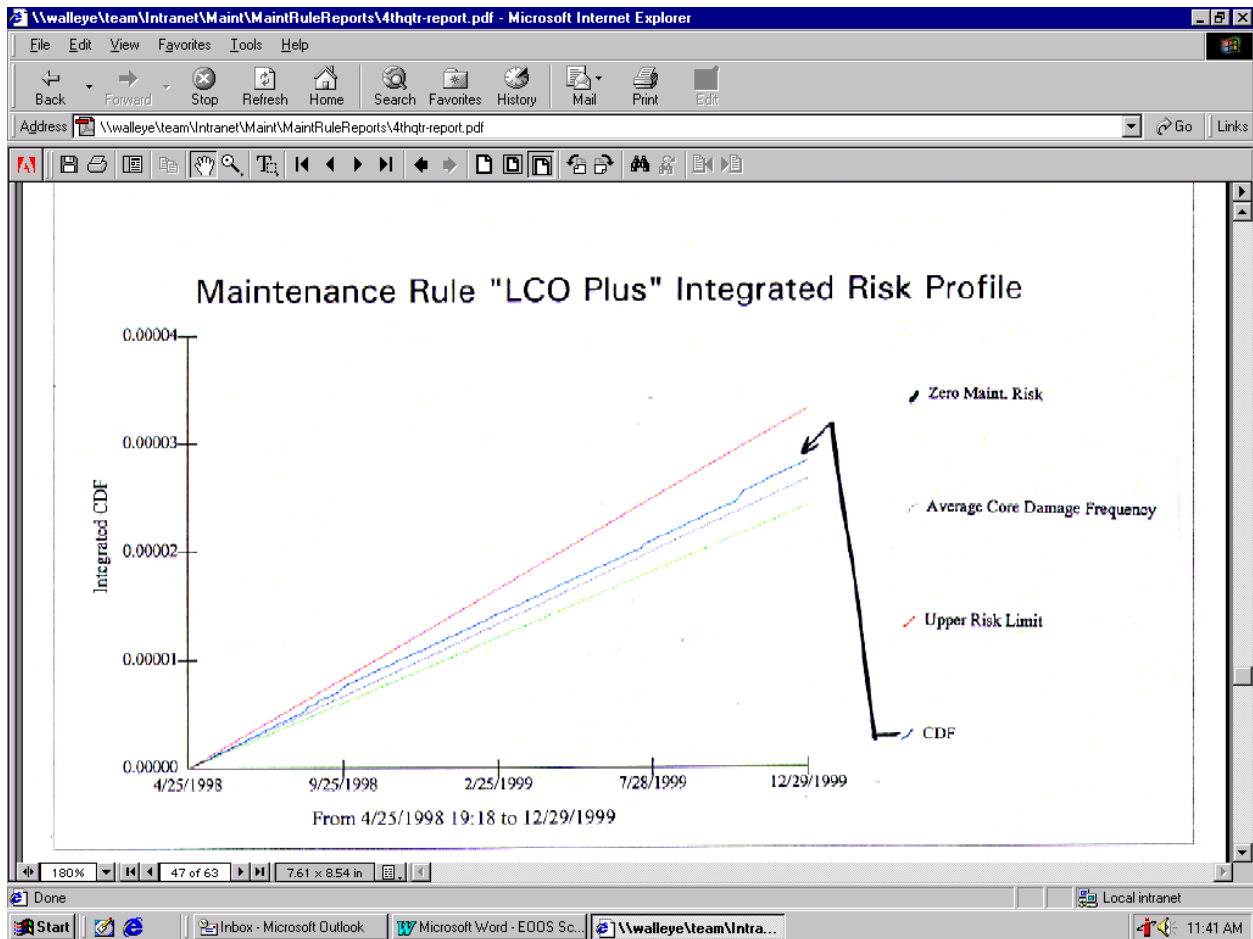


Figure 7  
Risk Management of On-Line Maintenance at MNGP  
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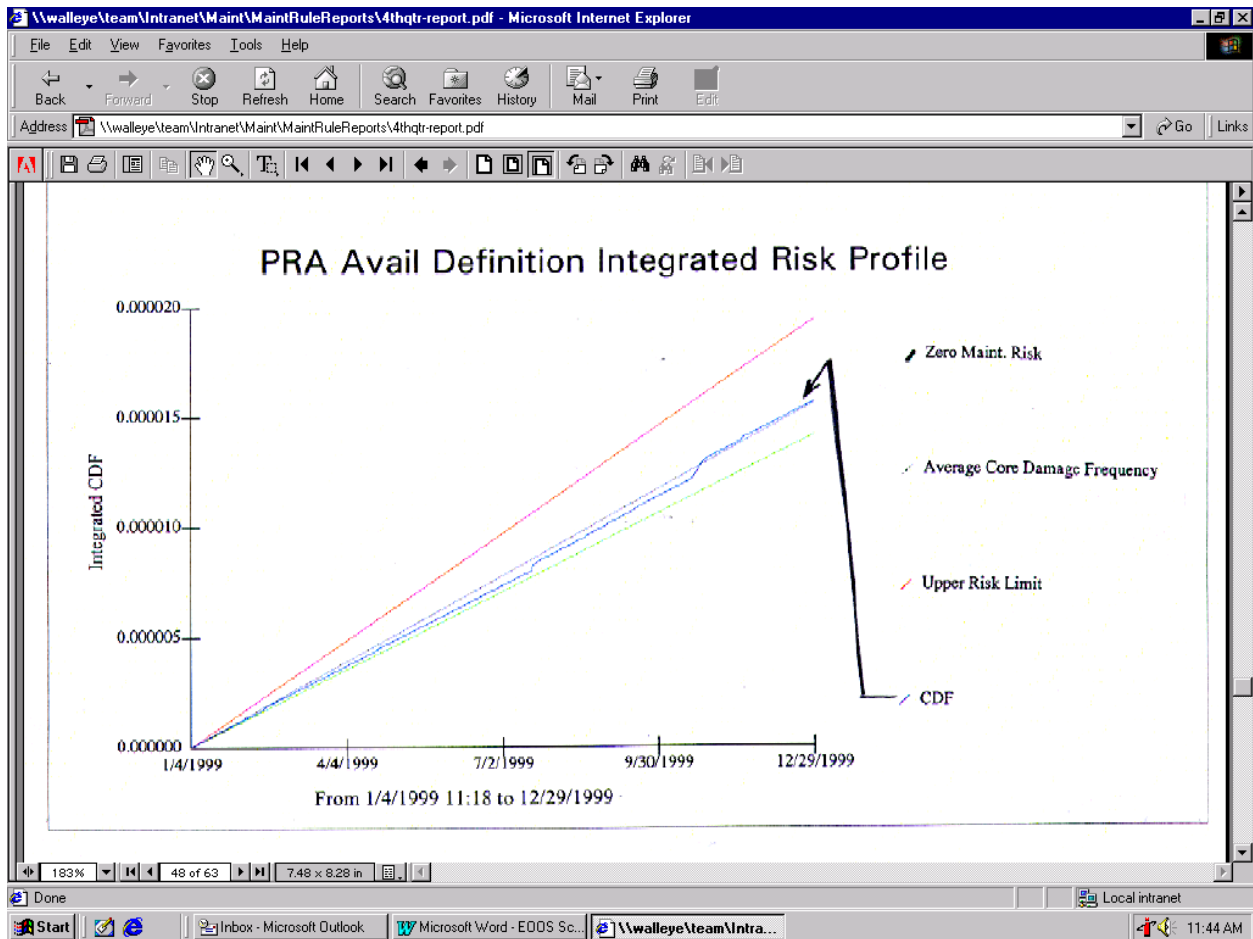


Figure 8  
Risk Management of On-Line Maintenance at MNGP  
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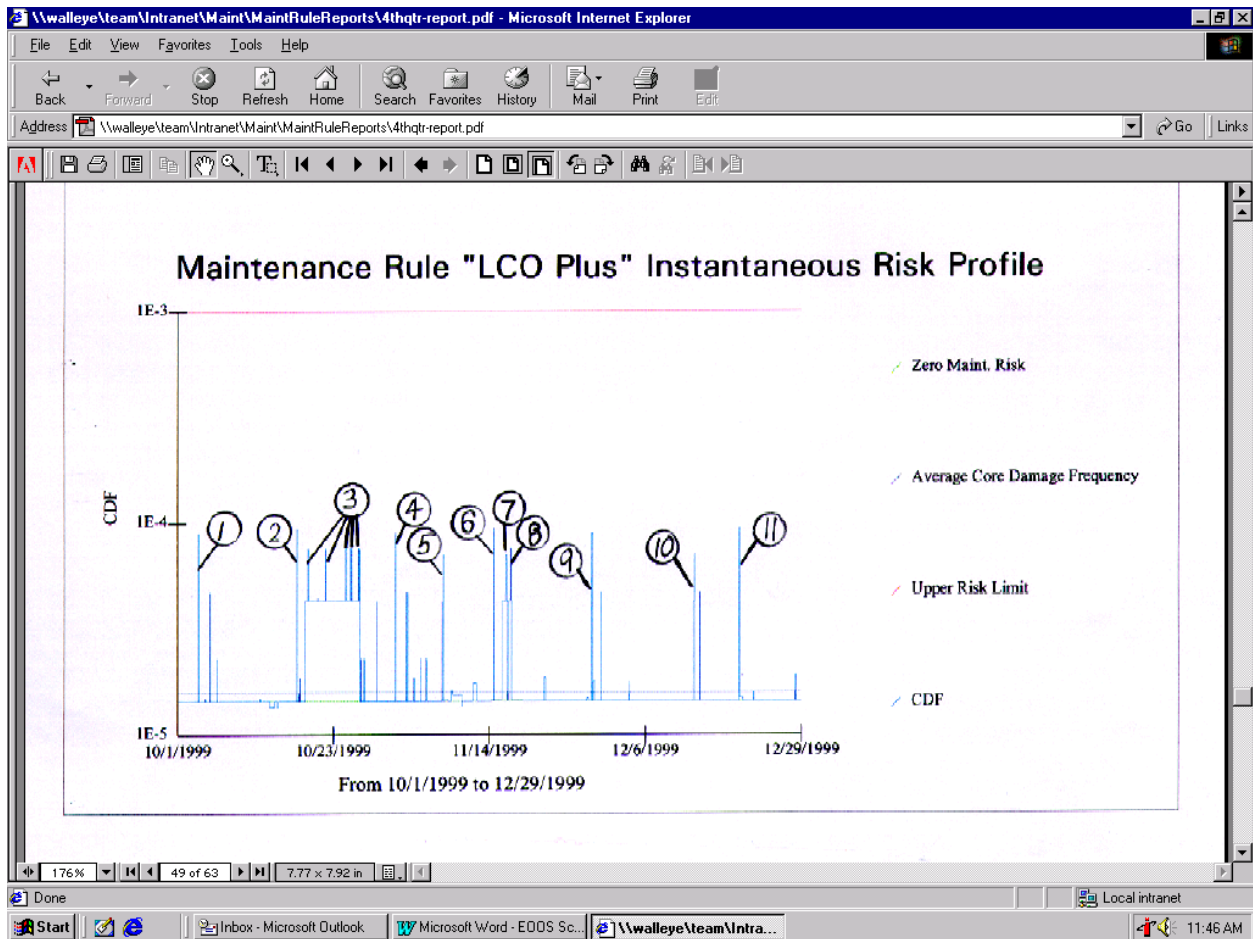


Figure 9  
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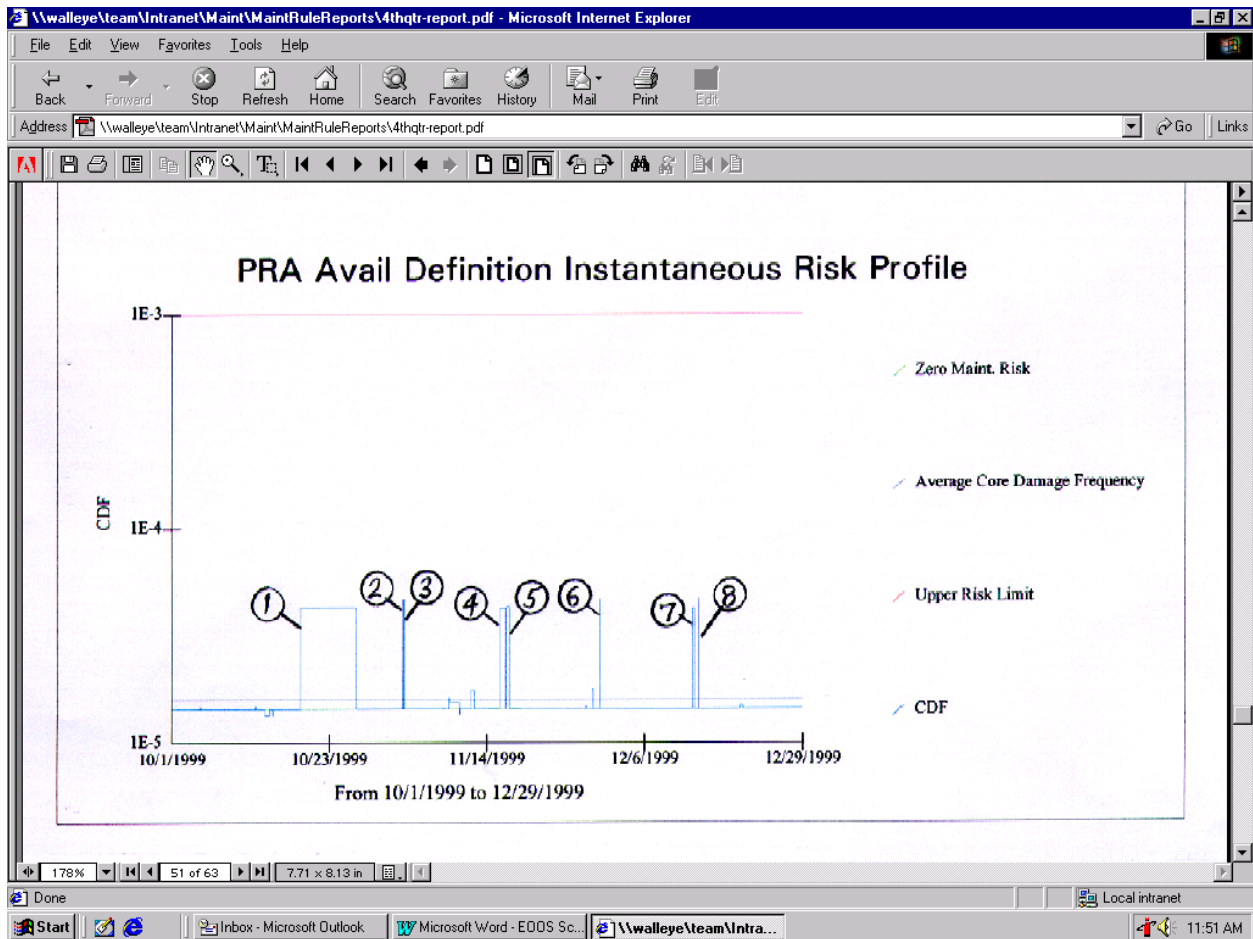


Figure 10  
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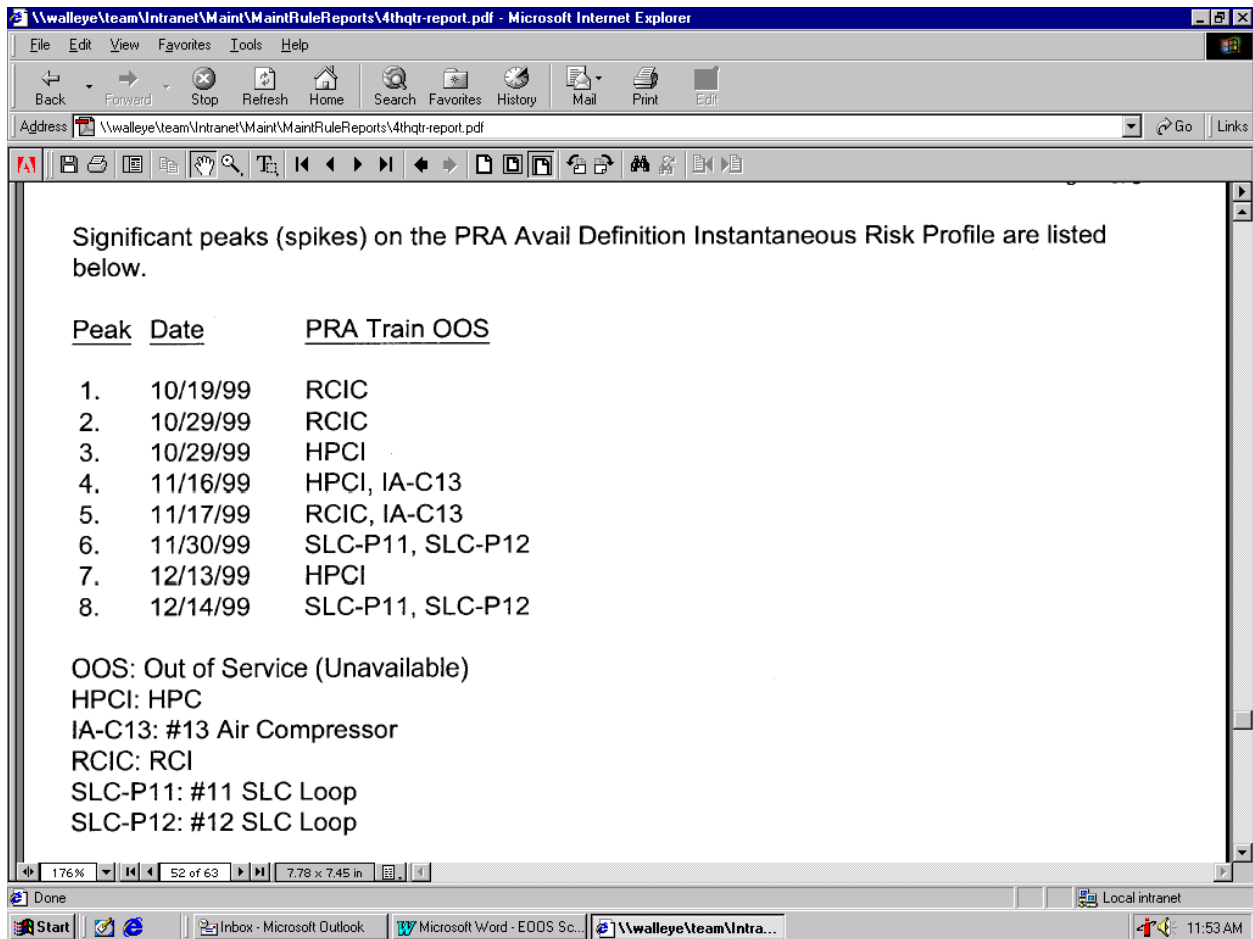


Figure 11  
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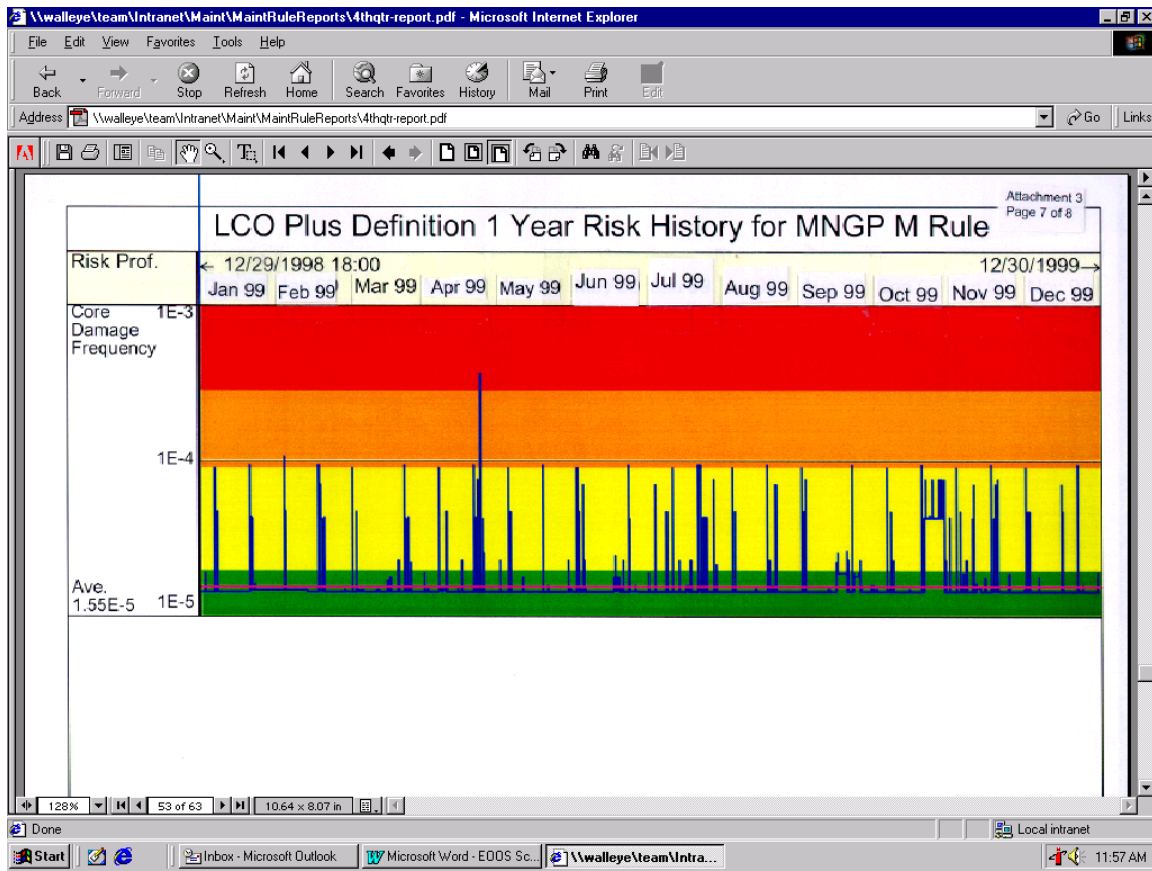


Figure 12  
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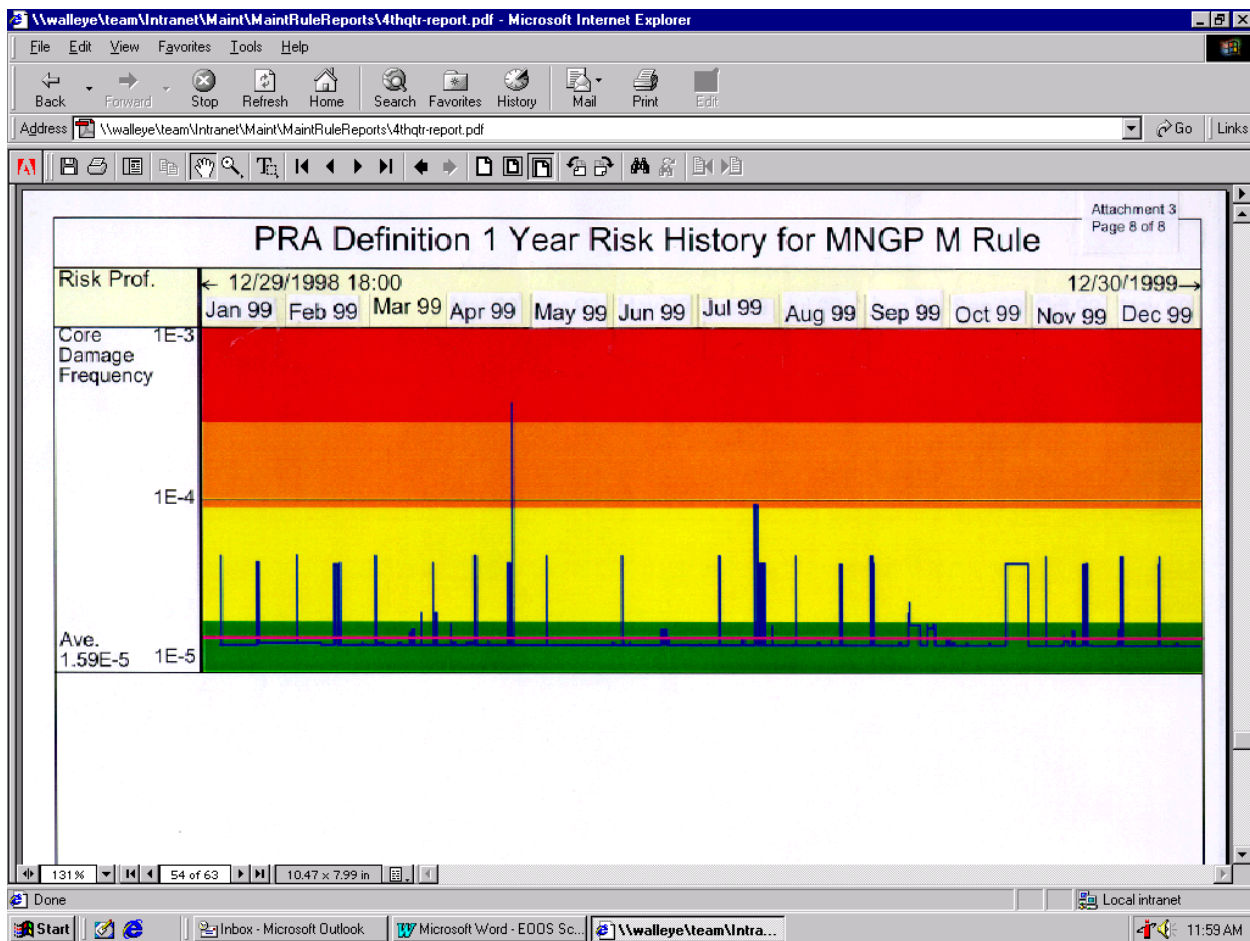


Figure 13  
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